



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

REC'D 19 AUG 2004

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Applicant's or agent's file reference CL2109PCT		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US 03/26324	International filing date (day/month/year) 21.08.2003	Priority date (day/month/year) 22.08.2002
International Patent Classification (IPC) or both national classification and IPC C07C17/20		
Applicant E.I. DU PONT DE NEMOURS AND COMPANY et al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>		
Date of submission of the demand 19.03.2004		Date of completion of this report 18.08.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Heibl, C Telephone No. +49 89 2399-8331 

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I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-20 as originally filed

Claims, Numbers

1, 2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

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**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1,2
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1,2
Industrial applicability (IA)	Yes: Claims	1,2
	No: Claims	

2. Citations and explanations

see separate sheet

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Re Item V -----

(The numbering of the prior art documents (D1,D2..) cited hereinafter corresponds to the order in which they are mentioned in the International Search Report.)

The present invention as claimed relates to a process for producing pentafluoropentane (HFC-125) where the amount of undesired chloropentafluoroethane by-product (CFC-115) is low.

The essential feature of the present process is seen to reside in the use of a certain fluorination catalyst, namely a crystalline cobalt-substituted α -chromium oxide or a fluorinated species thereof as defined in claim 1.

A process having the combination of technical features as indicated in present claim 1 is not disclosed in any of the prior art documents D1-D5 mentioned in the search report (ISR). The claimed process is thus considered to meet the criteria of Art. 33(2) PCT (novelty).

The closest prior art is considered to be the teaching of D3 (EP-A 1038 858). Indeed, this document is also concerned with a method of preparing HFC-125 by fluorinating suitable chlorine-containing ethane or ethylene derivatives (e.g. HCFC 123 or 124, perchloroethylene). The method described in D3 is said to be advantageous in that the total yield of chlorofluoroethane by-products (e.g. CFC-115) can be decreased without significantly deteriorating the generation activity of pentafluoroethane and compounds which can be recycled in the reaction system. Suitable fluorination catalysts suggested in D3 include 'Catalyst 3' which is a fluorochromium oxide containing cobalt in small amounts (see Table 2 on page 12). As for the preparation of HFC-125 using 'Catalyst 3', see page 15 and following pages. The chromium oxide catalysts disclosed in D3 are in an amorphous state, whereas the catalysts to be used in accordance with the present application are said to be in a crystalline state.

Given the technical teaching of D3, it would appear, however, that this difference (amorphous/crystalline form of the fluorination catalyst) does not automatically render the present process inventive. In this respect, the applicant's attention is also drawn to D4 (WO-A 98/10862) which discloses a chromia-based fluorination catalyst which is at least partially crystalline and which may contain an additional metal promoter (Zn,Co or Ni). Such catalysts may be used for preparing HFC-125. See D4, page 2, lines 4-7, page 7, lines 1-6, page 8, lines 3-5.

It thus not at present apparent that the subject-matter of claims 1-2 meets the

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requirements of Art. 33(3) PCT (inventive step).

The subject-matter of claims 1-2 is considered to be industrially applicable as required by Art. 33(4) PCT.